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MICROSCOPY.¹

New Method of Imbedding in a Mixture of Celloidin and Paraffine.²—Messrs. Field and Martin recommend the following method as an improvement on those proposed a few years ago by Ryder and Kultschizky. The method permits of imbedding the object directly in a mixture of celloidin and paraffine. The mixture is prepared by using as a solvent, alcohol and toluol (toluène); the latter, taking the place of ether, makes it possible to dissolve paraffine in the celloidin solution. Proceed as follows:

1. Make a mixture of absolute alcohol and toluol in equal parts.
2. Soak some dry celloidin in toluol; after some hours, add a little of the alcohol-toluol.³ The celloidin swells up and dissolves. The solution should have about the consistency of clove oil.
3. Finally, add to this mixture some shavings of paraffine, obtained by scraping the surface of a block of this substance with a scalpel. In order to hasten the solution and increase the proportion of paraffine the mixture may be heated a little. Above 20° to 23°, one runs the risk of precipitating the celloidin, which separates in a transparent granular mass.

These mixtures prepared, the process of imbedding is executed in the following manner: The object, taken from absolute alcohol, is placed in the alcohol-toluol. It is easily and quickly saturated, and is then placed directly in the imbedding mixture. The penetration is more rapid than in the ordinary celloidin solution. As soon as saturation is complete, one may proceed to solidify the celloidin. This may be done in two ways:

1. The object is transferred to a saturated solution of paraffine in chloroform, and when the solidification is complete (2-3ds.), the imbedding paraffine is carried out according to the well known method Bütschli.

¹Ed. By Prof. C. O. Whitman, University of Chicago.

²Bull Soc. Zool de France, XIX, p. 48, Mar. 13, 1894, and Zeitschr. f. wiss. Mikr., XI, 1, 1894.

³The alcohol-toluol is added after the toluol has been turned off. About 45cc is enough for 1 gm. of celloidin. This solution will dissolve about $\frac{1}{2}$ gm. of paraffine (melting at 56°) at ordinary room temperature.

2. The object is placed in toluol containing some paraffine in solution. The alcohol diffuses in the excess of toluol, and the celloidin solidifies. Imbed as before.

In both cases care must be taken to avoid shrinkage, which occurs if the celloidin is solidified in pure paraffine.

The object thus imbedded in paraffine is sectioned in the usual way. The ribbons of sections are fixed to the slide by means of the ordinary albumen fixative, or by the aid of pure water. In the latter case, the strips cut to the length desired are placed on a clean slide slightly wet with water. Then a little water is added by means of a brush, just enough to barely float the sections⁴. The slide is then heated so as to soften the paraffine without melting it. The sections expand readily. It remains only to drain off the water and let the slide dry completely.

If desired the celloidin may be removed by the mixture of alcohol and toluol which dissolves at once both the paraffine and celloidin. Then, after washing with toluol, the sections may be mounted in balsam in the usual way. If they are to be colored on the slide, they should be washed with alcohol and water.

On the Fixing of Paraffine Sections to the Slide.—A combination of the water method of Suchanek and Heidenhain with the albumen method of Mayer has been found very useful as it does away with the slow-drying of the former method and still permits the ready arrangement of the sections and their expansion and flattening.

A slide, cleaned with only ordinary care, is covered by means of the finger with the least possible amount of Mayer's Albumen. By means of a small brush the upper surface of the slide is then flooded with water and the brush, still slightly wet, is used for picking up and arranging the sections or ribbons. The brush may then be used for removing the excess of water, and the slide slightly warmed for a few moments on a water-bottle, care being taken that the sections do not melt. The sections soon expand and float upon the water which should be drained away and slide placed a second time upon the water-bath. After remaining about fifteen minutes the paraffine may be melted and the slide plunged into turpentine or some other solvent of paraffine.—H. C. BUMPUS, Marine Biological Laboratory, Woods Holl, Mass.

⁴The following note by Dr. Bumpus suggests an improvement.